at1121exam_practice EXAMPLE! DO NOT HAND IN FOR CREDIT (v12)

- If you are looking for a practice exam that you can hand in for credit:

https://chadworley.github.io/algtwo2026/u04/1121/at1121exam/at1121exam.html

Question 1

Simplify the radical expressions.

$\sqrt{27}$ $\qquad$ $\sqrt{45}$ $\qquad$ $\sqrt{99}$

$\sqrt{3 \cdot 3 \cdot 3}$ $\qquad$ $\sqrt{3 \cdot 3 \cdot 5}$ $\qquad$ $\sqrt{3 \cdot 3 \cdot 11}$

$3\sqrt{3}$ $\qquad$ $3\sqrt{5}$ $\qquad$ $3\sqrt{11}$

Question 2

Find all solutions to the equation below:

$$4(x+8)^2 + 9 \;=\; 73$$

First, subtract 9 from both sides.

$$4(x+8)^2 = 64$$

Then, divide both sides by 4.

$$(x+8)^2 = 16$$

Undo the squaring. Remember the plus-minus symbol.

$$x + 8 = \pm 4$$

Subtract 8 from both sides.

$$x = -8 \pm 4$$

So the two solutions are $x = -4$ and $x = -12$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 - 10x = -16$$

Take the linear coefficient, -10, halve it and square the result. You should get 25. Add this to both sides of the equation to complete the square.

$$x^2 - 10x + 25 = -16 + 25$$

$$x^2 - 10x + 25 = 9$$

Factor the perfect-square trinomial.

$$(x - 5)^2 = 9$$

$$x - 5 = \pm 3$$

$$x = 5 \pm 3$$

$$x = 8 \quad \text{or} \quad x = 2$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 2x^2 + 16x + 38$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 2 .

$$y = 2(x^2 + 8x) + 38$$

We want a perfect square. Halve 8 and square the result to get 16 . Add and subtract that value inside the parentheses.

$$y = 2(x^2 + 8x + 16 - 16) + 38$$

Factor the perfect-square trinomial.

$$y = 2((x + 4)^2 - 16) + 38$$

Distribute the 2.

$$y = 2(x + 4)^2 - 32 + 38$$

Combine the constants to get **vertex form**:

$$y = 2(x + 4)^2 + 6$$

The vertex is at point $(-4, 6)$.